

Fossils as Evidence

Teacher Facilitation Notes

In General . . .

- Project the slide deck in edit mode—do not show it as a slideshow.
- Hide the speaker notes before projecting. (View/Show Speaker Notes)
- Hide the toolbar. (Click on the up arrow at the right end of the tool bar.)
- Call on students to read the various content shown on slides.
- For each investigation, assemble the needed materials for each group and place in a central location for ease of distribution.
- Duplicate copies of the data sheets for each student.

Materials Needed:

Engage: Fossil or Not???

Fossil or Not Fossil Pictures, 1 set per group

Baggie, 1 per group

Student Data Sheet, 1 per student

Pencil, 1 per student

Explore: Remains of Past Organisms

Video Task Cards, 1 set per group

Pencil, 1 per student

Science Notebook, 1 per student

Baggie, 1 per group

Explain: Learning from Fossils

Venn Diagram, 1 per student

Pencil, 1 per student

Elaborate: Fossilized!

Small paper cup (3 oz.), 1 per student

Pencil, 1 per student

*Small plastic insect or spider, 1 per student

Non-stick cooking spray, 1 can

White glue (Elmer's), 1-2 gallons (depending on the number of students)

Evaluate

Quiz, 1 per student

Pencil, 1 per student

*Can be purchased through Oriental Trading Company, Amazon, and Dollar Tree

Fossils as Evidence

Teacher Facilitation Notes, p. 2

Engage: Fossil or Not

- Duplicate a set of *Fossil or Not* cards for each group. (Duplicate in color, if possible.) Cut apart and place in baggies.
- Introduce the title slide and discuss.
- Give each group a set of the cards. Have them follow the directions to sort the cards into two categories: Fossil or Not a Fossil.
- Allow time for groups to share how and why they sorted their cards. If desired, type their answers in the table on the last slide for this section.
- Do NOT give the correct answers at this time. Tell the students that they will be able to make changes to how they sorted the objects as they work through the lesson.

Explore: Remains of Past Organisms

- Use the slide to introduce as forming from the remains of organisms that lived long ago.
- Divide the class into groups of 4-6 students. Give each group a set of the task cards. Make sure each student has their science notebook ready to record the answers to the questions on the task cards.
- Start the video and let it play until the reader finishes page 7 of the book. Stop the video and have students discuss the answer to Video Task Card #1. Instruct them to record their answer to this card in their science notebooks.
- Continue the video, stopping and discussing at these locations:
 - Video Task Card #2, at the end of page 12 of the book
 - Video Task Card #3, at the end of page 17 of the book
 - Video Task Card #4, at the end of page 21 of the book
 - Video Task Card #5, at the end of page 25 of the book
 - Video Task Card #6, at the end of the video
- Read and discuss the remainder of the slides about how fossils form and the types of fossils paleontologists find.

Fossils as Evidence

Teacher Facilitation Notes, p. 3

Explain: Learning from Fossils

- Read and discuss the first three slides.
- Have students study the table of characteristics of the three different dinosaurs. Remind students that scientists infer these characteristics by studying the fossilized remains of the animals.
- Ask students to make inferences about the animals based on the information in the chart. For example:
 - The apatosaurus had 4 legs, but it moved slowly. Why do you think it was slow mover?
 - What type of teeth did the apatosaurus have? What did it eat?
 - What type of teeth did the spinosaurus have? What did it eat?
 - What is the relationship between a dinosaur's teeth and the food that they ate? etc.
- Have students study the fossilized remains of the pictured triceratops. Discuss what scientists might learn by studying these fossils.
- Have students read the characteristics of woolly mammoths and modern-day elephants. Have them complete the Venn diagram data sheet with information from the T-chart.
- Read and discuss the rest of the information about fossils as desired. (The emphasis in this Student Expectation is using fossils as evidence of past ORGANISMS. Do not put a lot of emphasis on past environments. That will be covered in a later grade.)
- Go back over the sorted Fossil or Not pictures shown in the engage section of the lesson. Allow students to define fossils in their own words and make any changes they would like to their original charts. Share the answers.

Elaborate: Fossilized!

- Have students follow the directions on the slide to make their own "insect in amber".
- Have the students put their cups of glue in a safe place as it make take up to 4 weeks for the glue to dry. Emphasize that this is a slow process but not as slow as the formation of a real fossil!

Evaluate

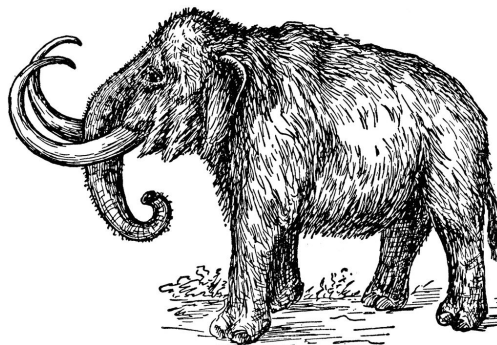
- Let students complete the quiz independently.
- Discuss evaluation activities as desired.

Evaluation

1. What is a fossil?
 - A The preserved remains or traces of plants or animals that lived long ago
 - B Shells found in deserts and grasslands all over the world
 - C An organism that is still alive today
 - D Rocks and minerals found in the ground and studied by scientists
2. Fossils can give evidence about organisms that lived thousands of years ago. Which of the following is NOT something a fossil can tell us about an ancient organism?
 - F What the organism looked like
 - G How organisms have changed over time
 - H What color an organism's eyes were
 - J In what type of environment the organism lived
3. Some modern-day animals are similar to ancient animals. One example of this is today's elephant and the past's woolly mammoth. What is one way elephants are similar to woolly mammoths?



Elephant



Woolly Mammoth

- A Long trunks and big bodies
- B Eyes on the side of their heads
- C Four legs
- D All of the above

Fossils as Evidence

Name: Key

Evaluation

4. Fossils can provide evidence about organisms that lived long ago. Which of the following is something fossils can tell us about the once-living plant or animal?
- F Fossils can provide evidence of how many babies an animal had.
 - G Fossils can tell paleontologists what color flowers were on a plant.
 - H Fossils can show scientists what plants attracted the most insects.
 - J Fossils can help scientists figure out the size of an organism.
5. Which of the following can fossils tell us about organisms that lived in the past? Mark all that apply.
- A The size of the organism
 - B How many seeds a plant might have
 - C Where the organism might have lived
 - D How ancient organisms are alike and different from today's organisms
 - E An animal's favorite food
 - F How old the organism was when it died
6. Scientists recently found the fossil pictured here. What can they infer about this dinosaur when it was alive? This dinosaur-
- F may have been scared of flying animals
 - G may have used its horns for defense
 - H was very small and slow-moving
 - J had thick green and brown skin



Fossils as Evidence

Name: _____

Engage: Fossil or Not

Object Photographs



Shark Tooth



Grasshopper



Insect in Amber



Chicken Bone



Ammonite



Oak Leaf



Water Bottle



Fern



Limulidae

Fossils as Evidence

Name: _____

Engage: Fossil or Not

Object Photographs



Horseshoe Crab



Petrified Wood



Fungi on Dead Log



Sphyraena in Rock



Rock Lacertilia



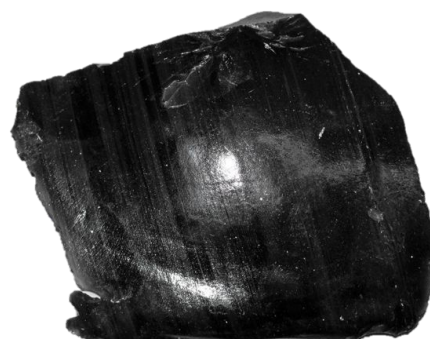
Pteridophyta in Rock



Animal Footprints in Rock



Fish Skeleton



Obsidian Rock

Fossils as Evidence

Name: _____

Engage: Fossil or Not

Directions:

1. Remove the sorting cards from the baggie.
2. Start with Card #1. As a group, decide whether or not the object in the picture is a fossil.
3. Write the name of the object in the correct column of the data table based on your decision.
4. Do the same for the rest of the cards.

Fossil	Not a Fossil

Explore: Remains of the Past

Video Task Cards

Video Task Card #1

What is a fossil?

Video Task Card #2

How does a dead organism become a fossil?

Video Task Card #3

How did dinosaur tracks become fossils?

Video Task Card #4

What are two other ways organisms become fossils?

Video Task Card #5

What do fossils tell us about past environments on the Earth?

Video Task Card #6

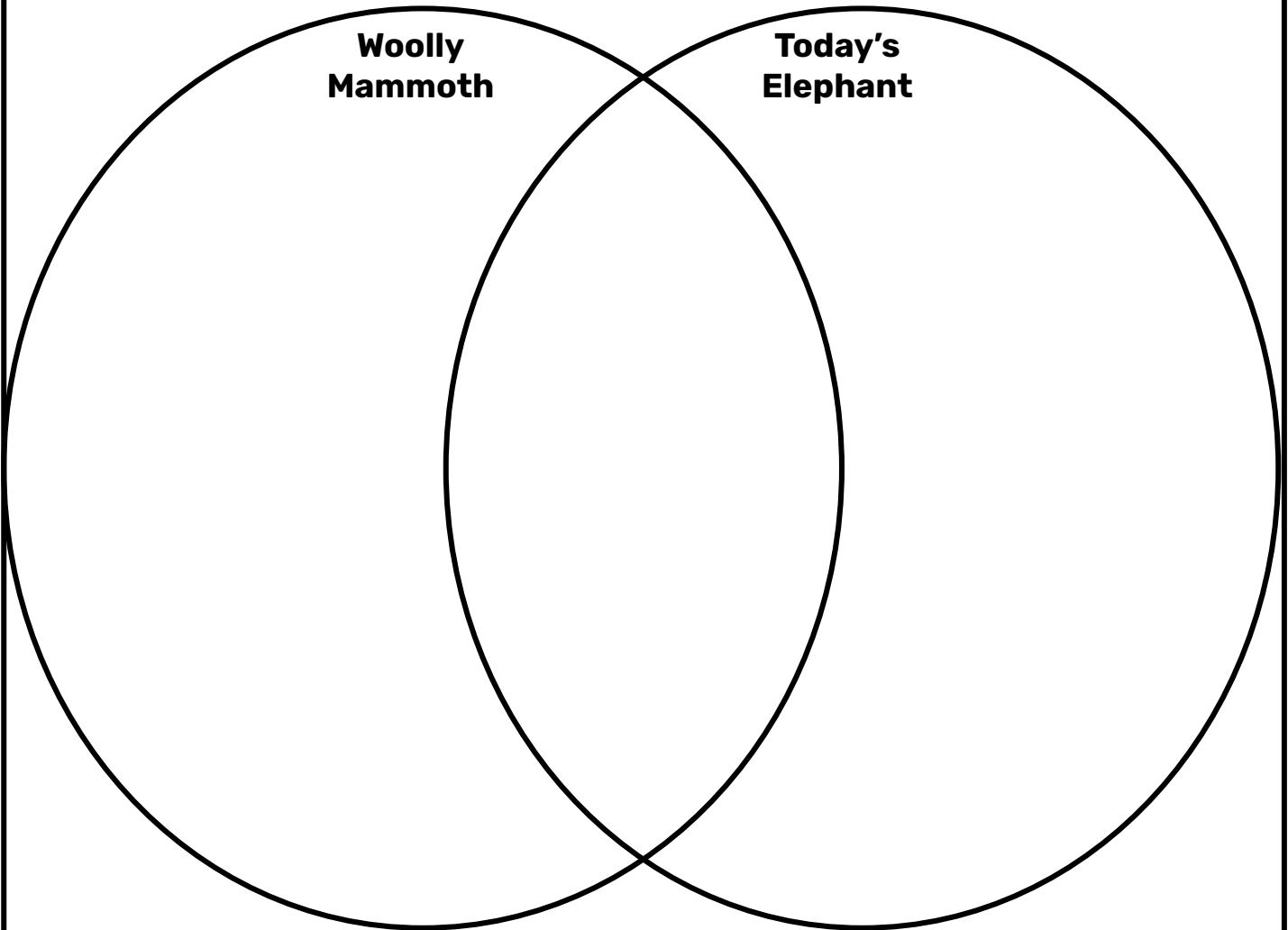
What other questions do you have about fossils?

Fossils as Evidence

Name: _____

Explain: Learning from Fossils

Directions: Use the Venn diagram to tell how woolly mammoths and today's elephants are alike and how they are different.



Phrases

Herbivore

Large, flat ears

Large bulge on forehead

Very curved tusks

Use trunks to survive

Legs same length

Extinct

Thick, woolly fur

Small forehead bulge

Slightly curved tusks

Legs different length

Long trunk

Alive today

Very little hair

Weight up to 6,800 kg

Small ears

Weight up to 9,100 kg

Thick skin

Fossils as Evidence

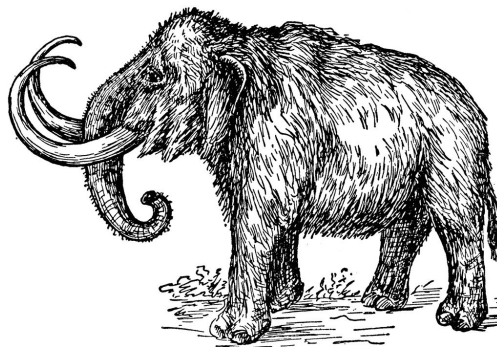
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Evaluation

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Fossils as Evidence

Name: _____

Evaluation

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